



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/764,496	01/27/2004	Vladimir Kochergin	340-87	2376
23117	7590	05/11/2006		
NIXON & VANDERHYE, PC 901 NORTH GLEBE ROAD, 11TH FLOOR ARLINGTON, VA 22203			EXAMINER ROSENBERGER, RICHARD A	
			ART UNIT	PAPER NUMBER
			2877	

DATE MAILED: 05/11/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.	Applicant(s)	
10/764,496	KOCHERGIN, VLADIMIR	
Examiner	Art Unit	
Richard A. Rosenberger	2877	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-63 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15, 17-21, 24-27, 29-36 and 46-63 is/are rejected.
- 7) ☒ Claim(s) 16, 22, 23, 28 and 37-46 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>7/29/2004</u> . | 6) <input type="checkbox"/> Other: ____.  |

Art Unit: 2877

1. Claims 21, and 56-61 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 21, "said layer of metal layer of modulated thickness" has no antecedent basis.

All of claims 56-61 are dependent directly from claims 1, and each refers to "the specimen", which has no antecedent basis in claim 1 nor in any of these claims.

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 7, 8, 17, 18, 20, 24, 25, 26, 52-55, 62 and 63 are rejected under 35 U.S.C. 102(b) as being anticipated by Kochergin et al, "Polariton enhancement of the

Faraday magnetooptic effect”, JETP Letters, vol. 668, No. 5 (10 Sept. 1998), pp. 400-403.

The reference was cited by Applicant in the Information Disclosure filed 29 July 2004.

As in independent claims 1, shown in figure 1 of the reference, the reference shows a structure comprising a substrate (1), and a plurality of thin-film layers (2, 3, 4) disposed on the substrate. At least one of the layers (2) comprises a magneto-optically active material, and at least one of the layers (3) has a thickness which is modulated in a predetermined fashion; the claim does not require that the two layer be different. The structure has at least one “optical mode” (a surface polariton) which is at least partially localized at the interface of the magneto-optic layer (page 400, second sentence of the second paragraph of the body of the article), and is thus also at least partially localized in the layer having modulated thickness.

Similarly for independent claims 62 and 63.

As in claims 7 and 25, as understood the surface polariton of the reference is a surface plasmon, and as in claims 8 and 26 this mode is supported by a single surface of the magneto-optic layer. As in claim 17, the magneto-optic layer is made of a ferromagnetic material; as understood, the Bi-IG film of the reference is a ferromagnetic material. As in claim 18, the magneto-optical layer has a silver (Ag) layer (3) disposed contiguously on the surface thereof. As in claim 20, as the reference is understood, the thin silver layer has a constant thickness. As in claim 24, the ferromagnetic (Bi-IG) layer has a modulated thickness.

As in claim 52, the reference discloses among the effects is a change in the polarization of the light (page 401, first sentence of the paragraph bridging pages 401 and 402), as in claim 53, the amplitude (page 401, last line) and, as in claim 54, phases (page 401, last line) of the light, and as in claim 55, all three. These claims are essentially method claims dependent from a structure claim, as such at most claim the potential of such detection or evaluation as only intended use; they do not claim any means to actually effect the evaluation.

5. Claims 2-6, 9, 12-16, 27, and 29-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kochergin et al, "Polariton enhancement of the Faraday magnetooptic effect", JETP Letters, vol. 668, No. 5 (10 Sept. 1998), pp. 400-403.

See above.

As for claims 2-6, the reference teaches forming a grating on the surface (page 400, first sentence of the second paragraph), but does not teach the specific structure of the grating. In the cited sentence, the disclosed purpose of the grating is to excite the polariton on the interface of the metal and the magneto-optic layer; it would have been obvious to form the grating in any form that accomplishes that purpose because that is the disclosed function of the layer.

As in claims 9, 12-16, 27, and 29-32, the reference does not disclose the various construction details. The reference discloses the use of a bismuth-containing iron garnet, but does not mention modifying it as in claims 12 and 29. As in claim 15 and 32, the reference does teach "easy-plane anisotropy" (page 400, line 7 within the second paragraph). Those in the art would have found it obvious to choose any type of

substrate and magneto-optic layer because the art would suggest that particular forms of these elements are not critical and alternative such as are claimed would be expected to work.

6. Claims 47-51 and 57-61 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kochergin et al, "Polariton enhancement of the Faraday magnetooptic effect", JETP Letters, vol. 668, No. 5 (10 Sept. 1998), pp. 400-403, in view of the acknowledged prior art.

The specification states that the use of magneto-optical indicator structures to examine specimens is known in the art; see paragraph [0006] in the specification as filed. That section does not disclose the use of surface polariton enhancement of the effect. The cited article discusses a similar arrangement which uses polariton enhancement of a magneto-optical. It would have been obvious to use such polariton-enhanced effect in the type of indicator structure used with a specimen because the enhancement provided would improve the detection.

7. The art does not appear to teach or suggest an indicator element in which a different layer than the magneto-optical layer is the modulated layer; in the reference only the modulated layer is modulated. Claims 19, 21-23, and 28 claim that a layer other than the magneto-optic layer is modulated, and thus appear to contain allowable subject matter.

The art does not appear to teach or suggest the waveguide mode of claim 37; thus claims 37-45 contain allowable subject matter. Nor does the art teach the use of a

Art Unit: 2877

"hybrid surface plasmon mode" and in claim 46, which thus contains allowable subject matter.

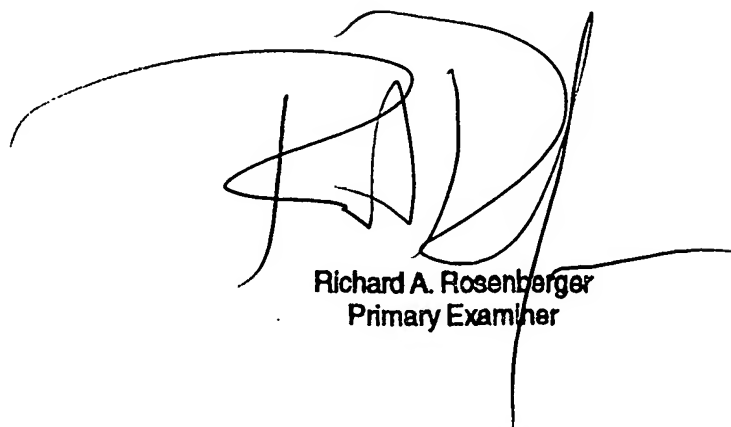
Claims 19, 22, 23, 28, and 37-46 would be allowable if rewritten in independent form including all of the limitations of their respective parent claims, as would claim 21 were the rejection above under 35 USC 112 overcome.

8. Kochergin (US 6,934,068) shows relevant related art.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard A Rosenberger whose telephone number is (571) 272-2428. The examiner can normally be reached on Monday through Friday during the hours of 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley, Jr. can be reached on (571) 272-2800 ext. 77. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

R. A. Rosenberger  
9 May 2006



Richard A. Rosenberger  
Primary Examiner